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HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P. O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER

ELPENORD, CANDAL

ART UNIT	PAPER NUMBER
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2416

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/730,390	Applicant(s) MELVIN ET AL.	
	Examiner CANDAL ELPENORD	Art Unit 2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on July 07, 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 6-8, 10 is/are rejected.
- 7) ☒ Claim(s) 2,4,5 and 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on July 07, 2009 have been fully considered but they are not persuasive.
2. The status of claims 1-10 remain pending. Claims 2, 4-5 and 9 were objected to.

Regarding claims 1, 3, the Applicants alleged that Erimli '258 does not teach or suggest **"providing each transmitting port in the network multiplexer with a high threshold and a low threshold" according to the definition of the phrases "low threshold" and "high threshold" in the current application.**

In response, the Examiner respectively disagrees with the Applicant's assertion because Erimli '258 does in fact teach the quoted claimed features above. In particular, Erimli '258 discloses ports with output queues associated with high water mark and low water mark thresholds in a network switch (fig. 6, network switch 12 for regulating the flow of data between station, col. 3, lines 21-25), col. 12, lines 5-32. Further, the Examiner asserts that Erimli '258 discloses the functional equivalent of the Applicants' claimed invention as broadly interpreted.

The Applicants further alleged that the high threshold associated with the transmit queue in the current claimed invention does not specify a maximum number of entries that are allowed to be queued to that transmit queue", the "high threshold is set a value less than the total capacity of the queue".

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies

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(i.e. "high threshold is set a value less than the total capacity of the queue") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The Applicants further alleged that the Examiner misrepresented claim 1 by omitting **"discarding the message descriptor, and when the transmit queue currently contains a number of message descriptors equal or greater than the high threshold of the associated transmitting port"**.

In response, the Examiner respectfully disagrees because in the U.S.C. 103 (a) rejection of the claim 1, Erimli '258 was cited for disclosing "when the transmit queue currently contains a maximum number of message descriptors (see, maximum number of frame pointers stored in the queue, col. 12, lines 15-22), sending a flow control request to the receiving port that received the communications packet referenced by the queued message descriptor" (see, generation of a pause frame to discontinue transmission of frame, col. 15, lines 44-51, noted: pause frame when the number of frame pointers in the queue has exceeded the high water mark, col. 12, lines 57 to col. 13, lines 9).

Erimli #2 '335 was cited for teaching what was missing from the teaching reference " when the transmit queue currently contains a maximum number of message descriptors, discarding the message descriptor (see, discarding of the frame pointers for output port associated if the queue does not have the capacity, see claim 12).

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In view of the above, argument and analysis, one skilled in the art would have been able to derive the claimed invention in view of the well-established teachings of Erimli '258 and Erimli #2 '335.

To summarize, the Examiner fails to see the difference between the Applicants' claimed invention and what is taught by the combined teachings of Erimli '258 and Erimli #2 '335 in response to the Applicants' assertions that the associated high thresholds as disclosed by Erimli '258 do not serve the same purpose as that of the current claimed invention.

Regarding claim 3, the Applicants alleged that it would have been obvious to one skilled in the art to send "a release flow-control request".

In response, the Examiner respectfully disagrees because sending "a release flow-control request" when the buffer's or queue's length has been reduced or the amount of frame pointers or data packets have dropped below the high threshold mark is well within the knowledge of those skilled in the art. In addition, whether one skilled in the art uses pause associated with timer or does not use a pause frame without a timer is moot because so long as the technique used accomplishes the same task of the same function as that of the claimed invention.

Regarding the rejection of independent claim 6, please consider the same arguments above in the view of Erimli '258 in view of Simmons '054.

In view of the analysis and arguments, the rejections are maintained as follows;

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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6. **Claims 1, 3** are rejected under 35 U.S.C. 103(a) as being unpatentable over Erimli et al (US 6,405,258 B1) in view of Erimli (# 2) et al (US 5,953,335)

Regarding claim 1, Erimli '258 discloses a method for initiating flow control in a network multiplexer (see, regulating the flow of data between station in a network switch, col. 3, lines 21-25, fig. 6, see multiport switch 12) that forwards a message descriptor referencing a communications packet (see, port with output queue for storing frame pointer corresponding to data frame stored in memory, col. 14, lines 16-23) received by a receiving port (fig. 6, Receiver 90a) to one or more transmit queues (fig. 6, see Queue 58a, 58b), each transmit queue associated with a transmitting port which transmits communications packets queued to the transmit queue (fig. 6, see ports 90a, 90b associated with queues 58a, 58b), the method comprising: providing each transmitting port in the network multiplexer with a high threshold and a low threshold (fig. 5A in combination with fig. 6, see high water mark and low water mark thresholds associated with output queues, col. 12, lines 5-32); when a message descriptor is queued to a transmit queue associated with a transmitting port packet (fig. 6, see, port with output queues 58a, 58b for storing frame pointers corresponding to data frames stored in memory, col. 14, lines 16-23), when the transmit queue currently contains a maximum number of message descriptors (see, maximum number of frame pointers stored in the queue, col. 12, lines 15-22), sending a flow control request to the receiving port that received the communications packet referenced by the queued message descriptor (see, generation of a pause frame to discontinue transmission of frame, col. 15, lines 44-51, noted: pause frame when the number of

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frame pointers in the queue has exceeded the high water mark, col. 12, lines 57 to col. 13, lines 9).

Erimli '258 discloses all the claimed limitations as set forth above with the exception of claimed features:

Regarding claim 1, when the transmit queue currently contains a maximum number of message descriptors, discarding the message descriptor.

However, Erimli '345 from the same field of endeavor discloses the above claimed features:

Regarding claim 1, when the transmit queue currently contains a maximum number of message descriptors, discarding the message descriptor (see, discarding of the frame pointers for output port associated if the queue does not have the capacity, see claim 12.

In view of the above, having the method and apparatus for controlling the flow of data through a network switch of Erimli '258 and method for selective discarding of frame pointers of Erimli #2 '335, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teaching features of Erimli '258 by incorporating teaching features as taught by Erimli #2 '335 in order to selectively drop frame pointers based on the queue capacity as suggested.

Regarding claim 3, Erimli '258 discloses the method (see, regulating the flow of data between station in a network switch, col. 3, lines 21-25, fig. 6, see multiport switch 12) further including: when a transmitting port transmits a packet referenced by a message descriptor, releasing the message descriptor, and when the destination port

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currently contains a number of queued message descriptors equal to one less than the destination port's low threshold (see, resuming the transmission when the threshold value falls below predetermined level, abstract, lines 8-15, col. 16, lines 53-58), sending a release flow control request to any receiving ports to which a flow control request was sent while the transmit queue contained a number of message descriptors equal to or greater than the high threshold of the associated transmitting port (see, generation of a pause frame to discontinue transmission of frame, col. 15, lines 44-51, noted: pause frame when the number of frame pointers in the queue has exceeded the high water mark, col. 12, lines 57 to col. 13, lines 9).

Erimli '258 does not explicitly send a release flow control request. However, one skilled in the art would be motivated to send a release flow control message when the threshold value of queue holding the pointers falls below the threshold in order to restart transmission based on the threshold level. Additionally, sending a flow-control release when the buffer's or queue's length has been reduced or the amount of frame pointers or data packets have dropped below the high threshold mark is well within the knowledge of those skilled in the art. In other words, given what is disclosed by Erimli '258, it would have been obvious to one skilled in the art to modify the teaching features of Erimli '258 by sending a flow-control release to arrive at the claimed invention. The motivation would have been to provide efficient transmission in the network switch.

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7. **Claims 6, 8, 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Erimli et al (US 6,405,258 B1) in view of Simmons et al (US 6,167,054).

Regarding claim 6, Erimli '258 discloses a network multiplexer system (see, regulating the flow of data between station in a network switch, col. 3, lines 21-25, fig. 6, see multiport switch 12) that links physically separate network media (fig. 6, see Station 14a coupled to the network switch 12) by forwarding packets received from each network medium to a number of network media (fig. 6, see port 90b in combination with station 14b), the network multiplexer system (see, regulating the flow of data between station in a network switch, col. 3, lines 21-25, fig. 6, see multiport switch 12) comprising: a number of ports, each port having a transceiver and a communications controller (fig. 6, CPU 32 in combination with the control logic 96 of the multiport switch 12 for implementing flow control, col. 14, lines 48-65); a memory (fig. 6, Memory 36 for storing data where a corresponding data frame is stored, col. 14, lines 16-23); an internal bus for transferring packets from ports to memory and from memory to ports; a receive queue and a transmit queue associated with each port that contain message descriptors that reference packets stored in memory (fig. 6, see, port with output queues 58a, 58b for storing frame pointers corresponding to data frames stored in memory, col. 14, lines 16-23); a high threshold and a low threshold associated with each transmit queue (fig. 5A in combination with fig. 6, see high water mark and low water mark thresholds associated with output queues, col. 12, lines 5-32); an indication of ports to which flow control requests have been made associated with each port (see, flow control counter for counting the number of pause frames

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transmitted or received each respective network port/station, col. 13, lines 41-49); and an indication of the number of flow control requests made to a port associated with each port (see, flow control counter for counting the number of pause frames transmitted or received each respective network port/station, col. 13, lines 41-49, where the pause frame causes the network to discontinue transmission, col. 15, lines 44-56).

Erimli '258 discloses all the claimed limitations with the exception of claimed features:

Regarding claim 6, an internal bus for transferring packets from ports to memory and from memory to ports.

However, Simmons '054 from the same field of endeavor discloses the above claimed features:

Regarding claim 6, an internal bus for transferring packets from ports to memory and from memory to ports (see, buffer manager in combination with the data bus 80 for transferring stored data frames from external memory to FIFO buffer, col. 7, lines 24-33).

In view of the above, having the method and apparatus for controlling the flow of data frames through a network switch of Erimli '258, the method and apparatus for providing flow control of frame pointers in a respective queue of Simmons '054, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teaching features of Erimli '258 by using teaching features as

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taught by Simmons '054 in order to transmit frame pointers via the internal bus to the destination ports.

Regarding claim 8, Erimli '258 discloses the network multiplexer wherein, when a message descriptor is forwarded to a port for transmission, and when the transmit queue of the port contains a number of message descriptors greater than or equal to the high threshold associated with the port, a flow control request is sent to the port that received the communications packet reference by the message descriptor (see, generation of a pause frame to discontinue transmission of frame, col. 15, lines 44-51, noted: pause frame when the number of frame pointers in the queue has exceeded the high water mark, col. 12, lines 57 to col. 13, lines 9) and a indication that a flow control request has been sent to the port that received the communications packet is saved by the port to which the message descriptor is forwarded (see, flow control counter for counting the number of pause frames transmitted or received each respective network port/station, col. 13, lines 41-49, where the pause frame causes the network to discontinue transmission, col. 15, lines 44-56).

Erimli '258 does not explicitly send a release flow control request. However, one skilled in the art would be motivated to send a release flow control message when the threshold value of queue holding the pointers falls below the threshold in order to restart transmission based on the threshold level which in turn gives rise to bandwidth efficiency.

Regarding claim 10, Erimli '258 discloses the network multiplexer (see, regulating the flow of data between station in a network switch, col. 3, lines 21-25, fig.

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6, see multiport switch 12) wherein, when a port removes a message descriptor from the transmit queue associated with the port, and when the number of messages contained in the transmit queue currently equal one less than the low threshold associated with the port (see, resuming the transmission when the threshold value falls below predetermined level, abstract, lines 8-15, col. 16, lines 53-58), a release flow control message is sent to each port referenced by indications saved by the port (see, flow control counter for counting the number of pause frames transmitted or received each respective network port/station, col. 13, lines 41-49, where the pause frame causes the network to discontinue transmission, col. 15, lines 44-56).

8. **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over Erimli et al (US 6,405,258 B1) in view of Simmons et al (US 6,167,054) as applied to claim 6 above and further view of Erimli #2 et al (US 5,953,335).

The combination of Erimli '258 and Simmons '054 disclose the network multiplexer system as set forth in the above rejection with the exception of claimed features:

Regarding claim 7, wherein, when a message descriptor is forwarded to a port for transmission, and when the transmit queue of the port is full, the message descriptor is dropped.

However, Erimli #2 '335 from the same field of endeavor discloses the above claimed features:

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Regarding claim 7, wherein, when a message descriptor is forwarded to a port for transmission, and when the transmit queue of the port is full, the message descriptor is dropped (see, discarding of the frame pointers for output port associated if the queue does not have the capacity, see claim 12).

In view of the above, having the combined teaching features of Erimli '258 with Simmons '054, and method for selective discarding of frame pointers of Erimli #2 '335, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teaching features of Erimli '258 with Simmons '054 by incorporating teaching features as taught by Erimli #2 '335 in order to selectively drop frame pointers based on the queue capacity.

Allowable Subject Matter

9. Claims 2, 4-5, 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. McClure et al (US 5,790,770).

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CANDAL ELPENORD whose telephone number is (571) 270-3123. The examiner can normally be reached on Monday through Friday 8:00AM to 5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Bin Yao can be reached on (571) 272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Candal Elpenord/
Examiner, Art Unit 2416

/KWANG B. YAO/
Supervisory Patent Examiner, Art Unit 2416